



Cyst decreased in size post maxillary sinus floor augmentation surgery in diabetic patient: A case report

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ABSTRACT

INTRODUCTION: Whether mucosal cyst of maxillary sinus is contraindication for sinus floor augmentation surgery has been a controversial hot spot for years.

PRESENTATION OF CASE: This case aims to present the surgical procedure of sinus floor augmentation surgery with cyst (18.72 mm × 24.61 mm) in diabetic patient. And 6 months later, the cyst decreased in size. The authors elevated the sinus floor and cyst simultaneously. The surgery was carried out successfully without sinus membrane perforation and the alveolar ridge gained about 8 mm height. Six months later, the cyst decreased in size and osseointegration was observed.

DISCUSSION: Interdisciplinary cooperation is encouraged to diagnose benign mucosal cyst. The isolation between sinus lumen and the grafted sub-sinus space is important. Graft contamination or dispersion into the sinus lumen should be avoided. The integrity of the sinus membrane and use of antibiotics are very important to prevent the occurrence of postoperative sinus infection

CONCLUSION: The authors conclude that sinus augmentation surgery could be done with mucosal cyst in diabetic patient.

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1. Introduction

Diabetic patients with maxillary posterior teeth lost often need Sinus Floor Augmentation Surgery. And what if there is a cyst? Diabetes and mucosal cyst have previously been contraindication for sinus augmentation [1]. Due to the pathologic changes, the risk for osteopenia, osteoporosis, poor osseous healing, and impaired bone regeneration increased in diabetic patients [2]. Meanwhile, the size change of the sinus cysts post-surgery has seldom been reported. This report presents the innovatory surgical procedure of sinus floor augmentation in the presence of mucosal cyst in diabetic patient, and 6 months later, the cyst decreased in size and osseointegration was achieved.

2. Presentation of case

The work has been reported in line with the CARE criteria [3]. A 52-year-old female patient who had 21 missing teeth demanded implant-supported prosthesis in authors' department. She had diabetes for 6 years and insisted insulin therapy. Her fasting plasma glucose was 6.6 mmol/L with insulin injection and haemoglobinA1C was 7.1%, which examined before the surgery.

Her teeth were extracted due to periodontal disease. So we suggested her to receive a course of periodontal treatment to stabilize the periodontal condition before surgery.

Then after a detailed dental examination, which included a routine dental examination, panoramic and cone beam computed tomography (CT) scans (*Dental*), we found that the crestal bone height between sinus floor and alveolar ridge of first molar (*Missing*) was only 2.37 mm on the right side. Meanwhile, there was a globous shadow (18.72 mm × 24.61 mm) in the sinus but it did not obstruct the osteomeatal complex (*Fig. 1*). We suggested the patient pay a visit to the otolaryngologists. And it was diagnosed as benign mucosal cyst. Due to no symptoms, the otolaryngologist suggested a routine observation afterwards. From the CT image, the cyst was firmly attached to the sinus lateral and medial wall. Because of the typically thick mucosal lining, the risk of perforation is rare if operating softly. Due to well-controlled blood glucose, the authors decided to elevate the sinus floor with the cyst.

The surgery was operated under local anaesthesia using 1.7 mL mixture of 40 mg/mL articaine and 10 µg/mL epinephrine. And the patient was orally premedicated with 1 g ornidazole before surgery. Assistant underwent the skin disinfection around and inside the mouth with alcohol and iodine cotton-balls, then draped the non-disinfected area. Horizontal and vertical releasing incisions were made. A full-thickness mucoperiosteal flap was reflected. After the lateral wall was exposed, a round bur in a low-speed, high-torque straight handpiece was used to mark the window outline under

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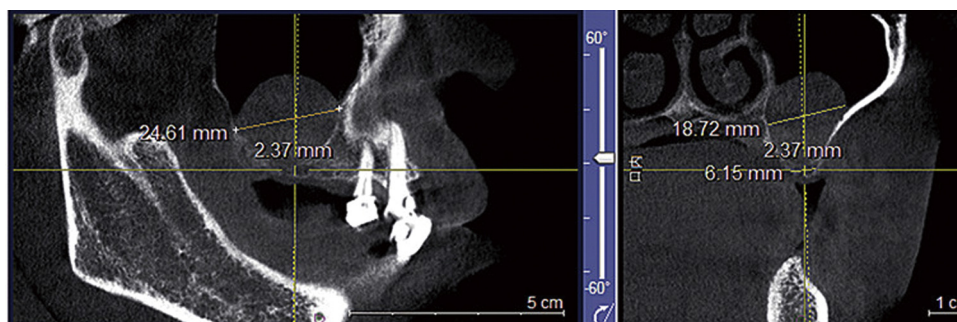


Fig. 1. CT show the crestal bone height between sinus floor and alveolar ridge of first molar was only 2.37 mm. The cyst (18.72 mm × 24.61 mm) was firmly attached to the sinus lateral and medial wall.

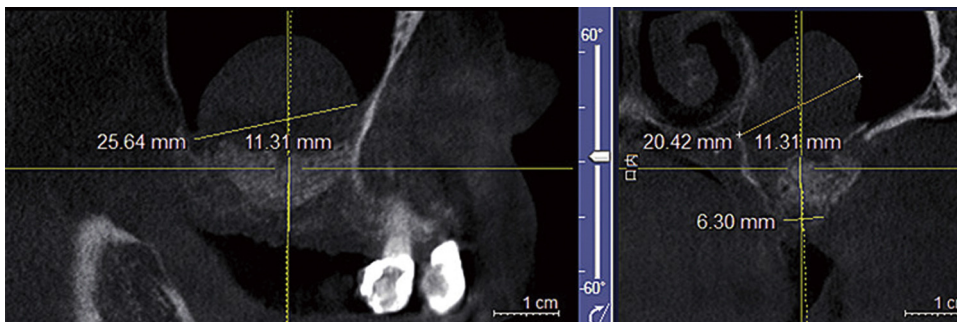


Fig. 2. CT show the crestal bone height between sinus floor and alveolar ridge of first molar was elevated to 11.31 mm. The cyst (25.64 mm × 20.42 mm) was complete and supported by the window wall and allograft. The sinus lumen was isolated from the grafted sub-sinus space.

copious sterile saline irrigation. Then the author used a round diamond bur in a high-speed handpiece to connect the marks under copious sterile saline irrigation. Finally, an oval window was created in the lateral wall. Then, the author fractured the window with slight force. After separating the membrane from the sinus wall, the cyst and membrane were elevated with the window in a slight force to 11 mm approximately. No cyst liquid was found leaking out. After the integrity of the sinus membrane was verified, 0.5 g bovine allograft (BIO-OSS Geistlich, Wolhusen, Switzerland) was mixed with autogenous bone powder that was gathered in the window preparing. Then the mixture was compressed with a blunt instrument into the prepared space. Then a Bio-Gide (Geistlich Pharma AG, Switzerland) was used to cover the window and the flap was repositioned and closed with interrupted sutures and multiple horizontal mattress sutures (3-0 silk). Chlorhexidine rinse and cefprozil were used for a week after the surgery.

The patient swelled the second day after surgery, but had no other symptoms relating to the surgery. Patient had CT scans immediately after the surgery. From the CT image, the crestal bone height between sinus floor and alveolar ridge was elevated to 11.31 mm.

The cyst (25.64 mm × 20.42 mm) was complete and supported by the window and allograft (Fig. 2).

Six months later, a CT scan was carried out. The scan showed that the ridge height of the first molar (Missing) was 10.08 mm, osseointegration was achieved and the cyst decreased in size (Fig. 3).

3. Discussion

Mucosal cyst is most common among paranasal sinus cysts. Giotakis concluded that mucosal cyst of the maxillary sinus represent 89.5–92.7% of all paranasal sinus cysts, the prevalence of mucosal cyst range from 3.6% to 35.6% [4]. It can be found in any walls of the maxillary sinus, with the majority of 66% located on the sinus floor. CT definition includes the following features: (1) free border with a smooth, spherical outline; (2) without bone erosion; (3) no connection with tooth, excluding odontogenic cysts; and (4) homogenous dome-shaped, clear lateral border demarcation [4].

The argument whether to remove mucosal cyst before augmentation surgery remains controversial. Ziccardi and Betts considered mucosal cyst as contraindication for sinus floor augmentation



Fig. 3. CT showed the crestal bone height between sinus floor and alveolar ridge of first molar was 10.08 mm. The cyst significantly decreased in size and osseointegration was achieved.

surgery and suggested interventions such as aspiration or removal before SFAS [5]. But some researchers doubted that. Kara presented a case of SFAS in the presence of MMC successfully [6]. Mardinger considered that the mucosal cyst is not contraindication for sinus augmentation for low frequency of perforation and post-surgery sinusitis [7].

In the present case, the elevating height was about 8 mm. Six months after surgery, we found the cyst was decreased in size and the patient had no associated symptoms. Moon represented the results of 133 patients with mucosal cyst in 2011. For a follow up of 24–36 months, 73% of all cysts remained unchanged, 5% increased, and 22% decreased or disappeared [8]. The author could not confirm the decreasing was associated with the surgery, but the isolation between sinus lumen and the grafted sub-sinus space might play an important role. Membrane perforation could lead to graft contamination; unnecessary damage to the membrane could lead to graft dispersion into the sinus lumen, which all could lead to failure of the surgery. Anyway, this surgery went successfully and osseointegration was achieved. Molon concluded that insulin therapy can prevent the occurrence of bone abnormalities in diabetic animals [9].

The authors think the integrity of the sinus membrane and use of antibiotics are very important to prevent the occurrence of post-operative sinus infection. All in all, the authors consider that sinus augmentation surgery could be done with cyst in diabetic patients if the blood glucose was well controlled. The argument will not end until more studies and systematic-reviews draw a conclusion.

Conflict of interest

The authors declared no conflict of interest.

Sources of funding

There is no financial support for this study.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy

of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

The study was fully approved by the ethic committee of the forth military medical university.

Authors' contribution

Sijia Zhang: Patient communication, information and data recording, surgery, article drafting. Yingliang Song: Surgery, literature review. Hongbo Wei: Editing the article, surgery. Shuai Ren: Analysis and interpretation of data.

Guarantor

Yingliang Song

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